

(c) Remarks

The pending claims under examination are 1, 3, 5 and 17 with claims 1 and 17 the independent claims. Claims 7-16 are withdrawn as non-elected. The subject matter of claims 2, 4 and 6 is added to claims 1 and 17. Reconsideration of the claims is expressly requested.

The objection to claims 1-6 as informal has been addressed.

Claims 1-6 and 17 were rejected as obvious over Stucky '705 in view of Nogues '980 and Miyata. The Examiner agrees Stucky does not teach holding the gel in an atmosphere containing water vapor at a humidity of 40-100% to form crystals of a metal oxide. Stucky is said to describe humidity as a result-effective variable. The Examiner argues Stucky teaches that films and monoliths can be produced by varying conditions such as humidity, but is silent as to the specifics of such treatment and the effect of such treatment. Nogues is cited for placing a gelled sol-gel in an oven at a lower temperature and heating at a humidity between 50 to 100 percent. Miyata is cited for a polyimide film treated with rubbing to give alignment control.

Claims 1-6 and 17 were provisionally rejected as an obviousness-type double patenting of Claims 1-4 and 7 of Application Number 11/267,156 ('156 Application) in view of Miyata. All the grounds of rejection are respectfully traversed.

Stucky distinguishes mesophase synthesis using surfactants for self-assembly from prior art such as Nogues which use an organic phase to provide toughness and do not use a structure-directing agent to produce mesoscopically ordered materials. *See* Stucky, page 3, line 21 to page 4, line 2 and page 7, lines 24-28. Stucky distinguishes his technique using surfactants from prior art techniques similar to Nogues which do not use surfactants and do not produce highly ordered mesoporous structures. Therefore, since Stucky teaches away from

Nogues synthesis scheme there would be no motivation to combine arbitrary portions of such disparate references.

Moreover, the artisan would not expect nor understand from Nogues that metal oxide crystals would form on the walls of the pores nor would the artisan appreciate the benefits thereof. There is no showing that by following the Nogues technique metal crystals would invariably (inherently) form. For an inherency argument to succeed the desired product must form, not may form, when following the prior art procedure.

In the present process it is crucial to employ a reactant solution containing at least a tin compound and a surfactant which solution coats a substrate to form a film. Thereafter, it is also critical to retain the substrate in an atmosphere containing water vapor at 40-100% humidity to form crystals of metal oxide in pore walls of the porous film formed. As noted on specification page 13, as solvent evaporates the concentration of surfactant exceeds micelle concentration, self-assembly of the surfactant begins and the self-organization of the metal is accelerated. The aggregate of surfactant forms micelles to become the template of pores and a honeycomb structure is formed. Furthermore, in the presence of water vapor the improvement of regularity of the mesostructure structure or the like is significantly accelerated. Water promotes hydrolysis of the metal to enhance crystallization of the walls of the micropores.

The presence of the surfactant in the pores allows the mechanical strength of the porous structure to be maintained. Further, pore size can be altered by selection of specific surfactants. The substrate must orient the film in a predetermined direction, wherein the film contains a tin oxide.

Nogues is directed to employing a gelling step to form a monolithic intermediate product with a desired shape and to thereafter ageing the solidified gel to express liquid from the

gel. Nogues conducts cross-linking in the gelling process. However, Nogues utilizes high humidity for the drying step and not for forming crystals of an oxide. Nogues develops pore sizes of 0.1-5 microns which is much larger than the pores of a mesoporous film which, by definition range from 2-50 nanometers. Miyata does not cure the defects of Stucky or Nogues.

Miyata forms a mesoporous silica film by hydrolyzing silicon alkoxide in the presence of tetraethoxysilane and hexadecyltrimethylammonium chloride. In contrast, applicants form a mesostructured film containing tin oxide formed from a tin compound reaction solution. There is no expectation that ordered alignment would be achieved when a tin compound is employed rather than a silicon-containing precursor. Miyata notes that it is important that partial bonding between the silica substrate surface and the mesoporous silica particle through dehydration of silanol groups occurs to maintain adhesive stability. See Miyata, page 1614. There are no silanol groups in the applicants tin oxide structure. Accordingly, alignment and adhesiveness are not expected.

With further regard to Nogues, the initial gelling step in Nogues can take from one hour to one month, preferably two hours to seven days, see column 4. No water vapor is disclosed to be present in this step. The following ageing step is a dual-step process involving heating the aged gel at high humidity and then heating the aged gel at low humidity. The dual ageing steps can take place over a period of from hours to months. No metal oxide crystals are said to be formed on the pore walls in the ageing step of Nogues.

Accordingly, the art rejection, having been overcome, should be withdrawn.

With regard to the obviousness-type double patenting rejection, claim 1 of the instant '242 Application requires the presence of the "a substrate having a capability of orienting an aggregate of the surfactant in a predetermined direction". The claims of the '156 application

include no such recitation. Therefore, one can practice the present claimed invention without conflicting with the '156 Application claims and vice-versa. It is only the claims which are considered in double patenting. The present claimed invention is a patentably distinct improvement over the '156 invention in its use of a surface with the ability to orient an aggregate of a surfactant. The "teachings" of the cases are not material, it is only the claims which are evaluated. The claims do not conflict with each other. This is the essence of double patenting. Here, each applicant can perform its claimed invention without conflicting with the other. There is no extension of the monopoly. Accordingly, the double patenting rejection, having been met, should be withdrawn.

The claims should be allowed and the case passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

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